

REMARKS

Claims 1-30 were pending in the application. Claims 1-30 stand rejected. Claims 1, 16, and 20 have been amended. Claims 1-30 remain in the application.

The Office Action noted a missing reference ("Digital Image Smoothing and the Sigma Filter" by Jong-Sen Lee) in the IDS and that another reference (" Digital Image Enhancement and Noise Filtering by Use of Local Statistics", IEEE TRANSACTIONS ON PATTERN ANALYSIS AND MACHINE INTELLIGENCE. VOL. PAM 1,2.NO. 2. MARCH 1980,JONG-SEN LEE) was supplied instead. The missing reference ("Digital Image Smoothing and the Sigma Filter" by Jong-Sen Lee) is supplied herewith and a Supplemental Information Disclosure Statement is submitted listing the earlier supplied reference ("Digital Image Enhancement and Noise Filtering by Use of Local Statistics", by JONG-SEN LEE) that was not previously listed.

Claims 1-30 stand provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1,4,5,6,9,10,17,19,23,24,25 and 26 of copending Application No. 10/016,601. The office action stated:

"Although the conflicting claims are not identical, they are not patentably distinct from each other because:

"Claims 1-30 of the instant application are broader than the copending application's (No.10/016,601) claims 1,4-6,9,10 and 23-26 that contains all the elements of claims 1-30 of the instant application.

"For example, claim 1 of the copending application No.10/016,601 contains the step of "applying the subject matter detector to the image to produce a belief map indicating the degree of belief that pixels in the image belong to target subject matter (claim 1, lines 5-7)" that can be found in claim 1, lines 4-6 of the instant application.

"Another example, claim 9 of the copending application No. 10/016,601 contains " wherein the image enhancement operation is sharpening" that can be found in claim 2 of the instant application.

"This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented."

It is believed that this amendment, discussed here, and an amendment in copending Application No. 10/016,601 will result in sufficient distinction between the claims of the two applications that the double-patenting rejection will be withdrawn.

Support for the amended claims is provided by the application as filed, notably, at page 5, lines 28-30; page 9, lines 16-17; page 10, lines 6-7; page 11, lines 4-18; page 13, lines 12-13.

Claims 1,2,5-30 stand rejected under 35 U.S.C. 102(b) as being anticipated by Savakis et al. (US Patent 6,738,494 B1; hereafter referred to as "Savakis"). Claims 3 and 4 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Savakis et al. (US Patent 6,738,494 B1) in view of Gouch et al. (US Patent 5,682,443 A; hereafter referred to as "Gouch").

Claim 1 states:

1. A method of improving a characteristic of an image according to its material content, said method comprising the steps of:
providing an image comprised of image pixels;
generating a belief map corresponding spatially to the image pixels, wherein the belief map includes belief values indicating the likelihood that respective pixels are representative of a particular material;
generating an improvement parameter from the belief values of the belief map, wherein the improvement parameter is proportional to the belief values and applied uniformly to the image pixels; and
using the improvement parameter to improve the characteristic of the image.

Claim 1 requires that a belief map includes belief values indicating the likelihood that respective pixels are representative of a particular material.

The rejection proposes that Savakis teaches this feature. Savakis does not support the rejection.

The rejection indicates that Savakis discloses a belief map including belief values:

"indicating the likelihood ... that respective pixels are representative of a particular material"

and cites Savakis, Fig. 2, num. 20 (flesh) and num. 24 (people). This position is contradicted, in Savakis, by the description of the image assessment network 10. The items cited in the rejection as "(Fig. 2,num. 20: flesh, fig. 2, num. 24: people)" are features of an ensemble used to calculate a value representative of image appeal using the network. (Savakis, col. 12, lines 46-52) The image appeal value is determined by integrating the features using a Bayes net or other reasoning engine. (Savakis, col. 20, lines 24-25; col. 21, lines 47-49) The resulting image appeal value is not simply representative of a particular material, since features other than particular material are important to the determination of image appeal value in Savakis. For example,

"Good composition is a very important positive attribute of picture emphasis and bad composition is the most commonly mentioned negative attribute." (Savakis, col. 16, lines 63-65; also see Fig. 2, num. 30)

The manner in which the features are considered in determining the image appeal value is not simply a function of the presence of a particular material:

"different evidences may compete with or contradict each other. On the other hand, different evidences may mutually reinforce each other according to prior models or knowledge of typical photographic scenes. Both competition and reinforcement are resolved by the Bayes net-based inference engine." (Savakis, col. 20, lines 25-30)

The image appeal value of Savakis, thus, does not indicate the likelihood that respective pixels are representative of a particular material.

Claim 1 also requires that the belief map of a single image includes multiple belief values. This contrasts with Savakis, in which the "belief map" has one value for each image of a group of images. Savakis states:

"The feature ensemble shown in FIG. 2, which is a subset of the feature ensemble shown in FIG. 1, is used to calculate a value representative of image appeal, which is defined as the intrinsic degree of importance, interest or attractiveness of an image in an absolute sense, that is, without reference to other images." (Savakis, col. 12, lines 46-52; emphasis added; Savakis likewise has a single emphasis value for an image--see Savakis, col. 12, lines 33-36)

Claim 1 also requires that the belief map corresponds spatially to the image pixels. In Savakis, in contrast, each appeal value (or emphasis value)

applies to a different image in a group of images. (Savakis, col. 10, lines 55-67)
It is unclear if the rejection is arguing that the appeal values of Savakis are combined in a "belief map" of multiple images. If so, such a multiple image "map" still contrasts with Claim 1, in which the belief map values indicate the degree of belief that pixels of a single image are representative of a particular material.

Claims 1-15 are allowable as depending from Claim 1 and as follows.

In relation to Claims 3-4, Gouch does not cure the above-indicated deficiencies in Savakis.

Claim 10 states:

10 (original). The method as claimed in claim 1 wherein the improvement parameter is proportional to an average belief value.

The rejection argued:

'Regarding claim 10, Savakis et al. discloses the method as claimed in claim 1 wherein the improvement parameter ("processing attribute values P" in col. 8, lines 54-56.) is proportional (Appeal "values ranking in the top quartile receive an image processing attribute value of 3" in col. 9, lines 1-6.) to an average belief value (Fig. 2, num. 36 outputs an averaged value in col. 14, lines 14,15 to generate an appeal belief or belief value.).'

The rejection incorrectly assumes that an "averaged value" would pass through integration of features in the Bayes net or other reasoning engine unchanged and unaffected by other features. (Savakis, col. 20, lines 24-25; col. 21, lines 47-49)
The approach of the rejection fails to consider that in Savakis, as earlier discussed, the manner in which the features are considered in determining the image appeal value is not simply a function of the presence of a particular feature. The effects of different features may compete with, or contradict, or mutually reinforce each other. (Savakis, col. 20, lines 25-30)

Claim 11 is allowable on the same grounds as Claim 10.

Claim 16 is supported by the application as originally filed, notably, the original claims and is allowable on the same grounds as Claim 1.

Claims 17-19 are allowable as depending from Claim 16. Claim 19 is also allowable on the same grounds as Claim 11.

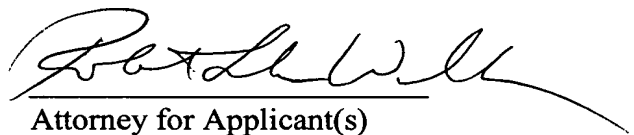
Claim 20 is allowable on the same grounds as Claim 1.

Claims 21-30 are allowable as depending from Claim 20. Claims 26-27 are also allowable on the same grounds as Claims 10-11.

It is believed that these changes now make the claims clear and definite and, if there are any problems with these changes, Applicants' attorney would appreciate a telephone call.

In view of the foregoing, it is believed none of the references, taken singly or in combination, disclose the claimed invention. Accordingly, this application is believed to be in condition for allowance, the notice of which is respectfully requested.

Respectfully submitted,



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Enclosures: Request for 1 Month Extension of Time
Supplemental IDS, Supplemental PTO-1449
Copy of Missing Reference, "Digital Image
Smoothing and the Sigma Filter", pages 255-269